MONTANA

Teachers' Retirement System

Component Unit of the State of Montana

ANNUAL REPORT

FISCAL YEARS ENDED JUNE 30, 1999 AND 1998

Marc Racicot, Governor

TEACHERS' RETIREMENT SYSTEM

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HELENA, MONTANA 59620-0139
(406) 444-3134
MARC RACICOT, GOVERNOR
STATE OF MONTANA

November 29, 1999

Honorable Marc Racicot
Governor of Montana
Room 204, State Capitol
Helena, MT 59620

Dear Governor Racicot:

On behalf of the Montana Teachers' Retirement Board, it is my pleasure to submit to you the 1999 Annual Report for the period from July 1, 1998, through June 30, 1999. This annual report, provides comprehensive information about the Montana Teachers' Retirement System including statements of financial condition, an actuarial report, historical and statistical information on active and retired members and benefit payments, as well as a description of the retirement plan.

The success of any organization is directly attributed to the dedication, commitment and proficiency of the personnel. On behalf of the Board, I would like to thank the staff, the Board's advisors, and the many people who continue to work diligently to assure the successful operation and improvement of the financial soundness of the Montana Teachers' Retirement System.

Sincerely,

David L. Senn
Executive Director

DLS/pc

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THE TEACHERS' RETIREMENT SYSTEM
DIRECTORS AND OFFICERS

BOARD OF DIRECTORS

JAMES TURCOTTE CHAIRMAN	07-01-97 to 07-01-01
EMILY H. BOGUT	07-01-98 to 07-01-02
TIM RYAN	07-01-98 to 07-01-00
VIRGINIA EGLI	07-01-97 to 07-01-01
SCOTT DUBBS	07-01-99 to 07-01-03
JIMA SEVERSON	07-01-97 to 07-01-01

ADMINISTRATIVE OFFICERS

DAVID L. SENN	Executive Director
GARY WARREN	Assistant Executive Director

PROFESSIONAL CONSULTANTS

MILLIMAN & ROBERTSON, INC.	Actuaries & Consultants Seattle, WA 98101

ALTERNATIVE ACCESSIBLE FORMATS OF THIS DOCUMENT WILL BE PROVIDED UPON REQUEST.

FINANCIAL SECTION

LEGISLATIVE AUDIT DIVISION

Scott A. Seacat, Legislative Auditor
John W. Northey, Legal Counsel
Tori Hunthausen, IT & Operations Manager

Deputy Legislative Auditors:
Jim Pellegrini, Performance Audit
James Gillett, Financial-Compliance Audit

INDEPENDENT AUDITOR'S REPORT

We have audited the accompanying Statement of Plan Net Assets of the Teachers' Retirement System, a component unit of the state of Montana, as of June 30, 1999 and 1998, and the related Statement of Changes in Plan Net Assets for each of the two fiscal years then ended. The information contained in these financial statements is the responsibility of the system's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosure in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Teachers' Retirement System as of June 30, 1999 and 1998, and its changes in plan net assets for the two fiscal years then ended in conformity with generally accepted accounting principles.

The Schedule of Funding Progress, Schedule of Contributions from the Employer and Other Contributing Entities, and the Year 2000 Issue are not part of the required basic financial statements but are supplementary information required by the Governmental Accounting Standards Board. We have applied certain limited procedures, which consisted principally of inquiries of management regarding the methods of measurement and presentation of the supplementary information. However, we did not audit the information and express no opinion on it.

The Actuarial Section and Statistical Section listed in the foregoing table of contents are presented for the purpose of additional analysis and are not a required part of the financial statements of the Teachers' Retirement System. Such additional information has not been subjected to the auditing procedures applied in our audit of the financial statements and, accordingly, we express no opinion on it.

Respectfully submitted,

James Gillett, CPA
Deputy Legislative Auditor

October 7, 1999

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TEACHERS' RETIREMENT SYSTEM
COMPONENT UNIT OF THE STATE OF MONTANA
STATEMENT OF PLAN NET ASSETS
JUNE 30, 1999 AND 1998

	1999	1998
ASSETS		
Current Assets:		
Cash	$3,306,674	$4,437,694
Cash Equivalents-Short Term Investment Pool (Note A)	61,559,792	30,606,718
Accounts Receivable	11,779,032	11,005,624
Interest Receivable	7,438,288	7,170,537
Total Current Assets	$84,083,786	$53,220,573
Investments, at fair value (Note A):		
Mortgages	$102,437,199	$99,857,435
Investment Pools	1,977,630,593	1,802,422,822
Other Investments	66,557,772	60,000,736
Total Investments	$2,146,625,564	$1,962,280,993
Securities Lending Collateral (Note A)	$164,691,227	$131,322,491
Other Assets:		
Land and Buildings	$193,844	$193,844
Less: Accumulated Depreciation	(109,772)	(106,009)
Intangible Assets	660,425	159,819
Equipment	137,249	137,249
Less: Accumulated Depreciation	(76,257)	(60,720)
Total Other Assets	$ 805,489	$ 324,183
TOTAL ASSETS	$2,396,206,066	$2,147,148,240
LIABILITIES		
Accounts Payable	$498,522	$6,620,273
Securities Lending Liability (Note A)	164,691,227	131,322,491
Compensated Absences (Note A)	50,888	46,028
Property Held In Trust	20,360	235
Installment Purchase Payable (Note E)	227,068	0
TOTAL LIABILITIES	$165,488,065	$137,989,027
NET ASSETS HELD IN TRUST FOR PENSION BENFITS (Schedule of Funding progress page A-13)	$2,230,718,001	$2,009,159,213

The accompanying notes are an integral part
of these financial statements

TEACHERS' RETIREMENT SYSTEM
COMPONENT UNIT OF THE STATE OF MONTANA
STATEMENT OF CHANGES IN PLAN NET ASSETS
FISCAL YEARS ENDED JUNE 30, 1999 AND 1998

	1999	1998
ADDITIONS		
Contributions:		
Employer	$44,986,852	$44,476,127
Plan Member	42,641,714	41,937,700
Other	102,540	200,083
Total Contributions	$87,731,106	$86,613,910
Rental Income	$19,975	$17,625
Workers Comp. Dividend	217	0
Investments Income:		
Net Appreciation/(Depreciation)		
In fair value of investments	$147,506,436	$195,343,125
Investment Earnings	93,901,242	92,870,223
Total Investment Income	$241,407,678	$288,213,348
Less Investment Expense	1,576,861	1,408,732
Net Investment Income	$239,830,817	$286,804,616
Security Lending Income (Note A)	8,600,474	9,304,669
Less Security Lending Expense (Note A)	(8,110,090)	(8,972,791)
Total Security Lending Income	$ 490,384	$ 331,878
Total Net Investment Income	$240,321,201	$287,136,494
DEDUCTIONS		
Benefit Payments	$100,028,083	$94,204,970
Withdrawals	5,126,013	4,826,198
Administrative Expense (Note D)	1,360,660	881,452
Total Deductions	$106,514,756	$99,912,620
NET INCREASE IN PLAN NET ASSETS	$221,557,743	$273,855,409
NET ASSETS HELD IN TRUST FOR PENSION BENFITS BEGINNING OF YEAR	2,009,159,213	1,735,370,004
PRIOR PERIOD ADJ. (Note A)	1,045	(66,200)
END OF YEAR	$2,230,718,001	$2,009,159,213

The accompanying notes are an integral part
of these financial statements

NOTE A. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Accounting

The Teachers' Retirement System, a discretely presented component unit Pension Trust Fund of the State of Montana financial reporting entity, maintains its accounts on the full accrual basis of accounting. Employee and employer contributions are recognized as revenues in the period in which employee services are performed and expenses are recorded when the corresponding liabilities are incurred, regardless of when payment is made.

Valuation of Investments

Investments are reported at fair value. Short-term investments and state securities are recorded at cost which approximates fair value. Mortgages were decreased by unaccumulated mortgage discount of $28,087 in fiscal year 1999 and $35,309 in fiscal year 1998. No investment in any one organization represents 5% or more of the net assets available for pension benefits. Investment units are bought/sold on the first business day of each month upon the decision of the Board of Investment's (BOI) Chief Investment Officer.

The six areas of investment at June 30, 1999, include: Montana Stock Pool (Montcomp); Montana International Equity Pool (MTIP); Montana Short-Term Investment Pool (STIP); Retirement Funds Bond Pool (RFBP); Montana Real Estate Pool (MTRP); and Other Investments.

1. Montcomp portfolio consists of common stock in public corporations and convertible equity securities. Unit values are calculated weekly based upon the fair value of equity holdings and other assets. Value at June 30, 1999 was $916 per unit.

2. MTIP portfolio includes equity investments in four funds – BOI Internal International, Pyrford International, Schroder Capital Management International and S G Pacific Assets Management. The four funds may invest in securities of foreign-based corporations listed on legal and recognized foreign exchanges as well as domestic exchanges. Security types may include ordinary common shares, preferred shares, convertible securities, American Depositary Receipts (ADR's), Global Depositary Receipts (GDR's) and other global securities, as appropriate. Unit values are calculated weekly based upon the fair value of equity holdings, other assets and liabilities. Value at June 30, 1999 was $107.65 per unit.

3. STIP as per Montana Code Annotated (MCA) section 17-6-201, 202 and 204, requires investments by state agencies of available funds. Value at June 30, 1999 was $1 per unit. STIP portfolio includes asset-backed, variable-rate and covered option securities to provide diversification and a competitive rate of return.

Asset-backed securities are debt securities collateralized by a pool of mortgage and non-mortgage assets pledged by the issuer and have one or more forms of credit enhancement to raise the quality of the security.

Variable rate securities provide many advantages of short-term bonds because they are designed to minimize the investor's interest rate risk. As with variable rate loans issued by banks, the interest rate paid by the issuer of these securities is reset periodically depending on market conditions. The value of these securities will usually remain at or near par because their interest rates are reset to maintain a current market yield.

Covered options are contracts granting the right, on a given date, to buy or sell bonds, backed by cash or the underlying securities, in exchange for an agreed upon sum or premium.

According to GASB Statement No. 31, Accounting and Financial Reporting for Certain Investments and External Investment Pools, STIP is considered an external investment pool. An external investment pool is defined as an arrangement that pools the monies of more than one legally separate entity and invests, on the participant's behalf, in an investment portfolio. STIP is also classified as a "2a7-like" pool. A 2a7-like pool is an external investment pool that is not registered with the Securities and Exchange Commission (SEC) as an investment company, but has a policy that it will, and does, operate in a manner consistent with the SEC's Rule 2a7 of the Investment Company Act of 1940. If certain conditions are met, 2a7-like pools are allowed to use amortized cost rather than fair value to report net assets to compute unit values. The Board of Investments has adopted a policy to treat STIP as a 2a7-like pool.

4. RFBP portfolio includes corporate asset-backed, other corporate, U. S. government mortgage-backed, U. S. government and yankee securities. Unit values are calculated weekly based on portfolio pricing. Value at June 30, 1999 was $101.95 per unit. Realized portfolio gains/losses are distributed at least annually. The RFBP portfolio includes structured financial instruments known as REMICs (Real Estate Mortgage Investment Conduits). Some REMICs are principal-only strips (Pos) and interest-only (Ios). TRS has 40% ownership in the RFBP.

5. MTRP was created as of July 1, 1998, by a spin-off of the Real Estate Investment Trust (REIT) investments held in the Montana Stock Pool. REIT is a corporation that combines the capital of many investors to acquire or provide financing for all forms of real estate. REIT real estate investments may include shopping centers, office buildings, apartment complexes and hotels.

MTRP portfolio includes common or preferred stocks or securities convertible into common stock or preferred stocks. Unit values are calculated weekly based upon the fair value of REIT holdings. Unit value as of June 30, 1999 was $469 per unit.

6. Other Investments are purchased in accordance with the statutorily mandated "Prudent Expert Principle" and applicable investment restrictions of the participants. The portfolio includes securities classified as corporate asset-backed, other corporate, US government mortgage-backed, US government, Yankee bonds, venture capital, leveraged buyouts, other alternative equities, real estate, mortgages and loans. Corporate asset-backed securities represent debt securities collateralized by a pool of assets. US government mortgage-backed securities reflect participation in a pool of residential mortgages. US government securities include direct obligations of the US Treasury and indirect obligations of the US government. Yankee bonds are US dollar denominated bonds issued by foreign corporations and governments and US companies issuing debt in foreign markets. Venture capital represents private equity investments in early stage financing of rapidly growing companies with an innovative product or service. Leveraged buy-outs permit investment groups to acquire a company by leveraging debt, as a financing technique, to establish a significant ownership position on behalf of the company's current management team.

Fair values of investments for publicly traded securities are determined primarily by reference to market prices supplied to BOI by BOI's custodial bank, State Street Bank and Trust. The real estate investments and mortgages are valued based on a discounted cash flow. The commercial in-state coal tax loans, money market savings account and the nonparticipating repurchase agreements are reported at amortized cost.

Real Estate – In January 1996, BOI, on behalf of the Public Employees' and Teachers' Retirement funds, purchased the 100 North Park Avenue building in Helena, Montana as a real estate investment. Acquired for a cost of $4,864,326, the building carries a June 30, 1999 fair value of $5,008,000.

Security Lending – Under the provisions of state statutes, BOI, via, a Securities Lending Authorization Agreement authorized the custodial bank, State Street Bank and Trust, to lend the BOI securities to broker-dealers and other entities with a simultaneous agreement to return the collateral for the same securities in the future. During the period the securities are on loan, BOI receives a fee and the custodial bank must initially receive collateral equal to 102 percent of the market value of the loaned securities and maintain collateral equal to not less than 100 percent of the market value of the loaned security. BOI retains all rights and risks of ownership during the loan period.

During fiscal year 1999, State Street loaned, on behalf of BOI, certain securities held by State Street, as custodian, and received US dollar currency cash, US government securities, and irrevocable bank letters of credit. State Street does not have the ability to pledge or sell collateral securities unless the borrower defaults.

BOI did not impose any restrictions during fiscal year 1999 on the amount of the loans that State Street made on its behalf. There were no failures by any borrowers to return loaned securities or pay distributions thereon during fiscal year 1999. Moreover, there were no losses during fiscal year 1999 resulting from a default of the borrowers of State Street.

During fiscal year 1999, BOI and the borrowers maintained the right to terminate all securities lending transactions on demand. The cash collateral received on each loan was invested, together with the cash collateral of other qualified plan lenders, in a collective investment pool, the Securities Lending Quality Trust. The relationship between the average maturities of the investment pool and BOI loans was affected by the maturities of the loans made by other plan entities that invested cash collateral in the collective investment pool, which BOI could not determine. On June 30, 1999, BOI had no credit risk exposure to borrowers.

Compensated Absences

Compensated absences represent 100 percent of accrued vacation and 25 percent of accrued sick leave for Teachers' Retirement System personnel at June 30, 1999 and June 30, 1998.

Minnie Fullam Fund

The Minnie Fullam Fund, a legacy fund that was administered by the Teachers' Retirement System was closed during fiscal year 1998, and the monies used for computer system enhancements.

Accounting and Reporting Changes

Prior Period Adjustments – During fiscal year 1999, TRS received from the Public Employees' Retirement Board a refund of 70% of the interest assessment by the Social Security Administration and the STIP investment earnings. The assessment was for Social Security contributions for part-time employees for the years 1984-1986. PERB, the collecting agency, retained the interest payment owing SSA pending final settlement and invested the interest payment in STIP.

Effective July 1, 1997, the State's equipment capitalization limit was increased from $1,000 to $5,000. State agencies are required to capitalize fixed assets only if an item's unit cost is $5,000 or more. During fiscal year 1998, items purchased during prior periods for less than the new threshold was removed from the Property Accountability Management System (PAMS).

NOTE B. DESCRIPTION OF PLAN

The Teachers' Retirement Board is the governing body of a mandatory multiple-employer, cost-sharing defined benefit pension plan, which provides retirement services to all persons in Montana employed as teachers or professional staff of any public elementary or secondary school, colleges of technology or unit of the university system. The system was established by the state of Montana in 1937 and is governed by Title 19, chapter 20, of the MCA.

At June 30, 1999, the number and type of reporting entities participating in the system was as follows:

Local School Districts	393
Community Colleges	3
University System Units	6
Colleges of Technology	3
State Agencies	6
TOTAL	411

At June 30, 1999, the system membership consisted of the following:

Retirees and Beneficiaries Currently Receiving Benefits	8,358
Terminated Employees Entitled to But Not Yet Receiving Benefits	9,821
Current Members:	
Vested	12,035
Nonvested	6,252
Total Membership	36,466

The pension plan provides retirement benefits and death and disability benefits. Employees with a minimum of 25 years of service or who have reached age 60 with 5 years of service are eligible to receive an annual retirement benefit equal to 1.6667% times creditable service years times the average final compensation. Final compensation is the average of the highest three consecutive years of earned compensation. Benefits fully vest after 5 years of creditable service. Vested employees may retire at or after age 50 and receive reduced retirement benefits.

Effective January 1, 1988, university system employees eligible to participate in the Teachers' Retirement System could elect to participate in an Optional Retirement Plan established by the Board of Regents. As of July 1, 1999, a total of 3,239 university system employees have elected to participate in the Optional Retirement Plan. Effective July 1, 1993, membership in the Optional Retirement Plan is mandatory for new employees to the university system unless they are already a member of the Teachers' Retirement System.

Effective January 1, 1990, certain members of the Teachers' Retirement System are eligible to receive a post retirement adjustment (PRA). The PRA is funded only when annual investment earnings are in excess of the actuarially required rate, currently 8%. To be eligible, a retiree or beneficiary must be receiving a monthly benefit for 24 months preceding June 30 each year. There were no post retirement adjustments in fiscal years 1998 and 1999.

NOTE C. CONTRIBUTIONS

The TRS funding policy provides for monthly employee and employer contributions at rates specified by state law. Plan members are currently required to contribute 7.044% of their earned compensation and employers contribute 7.47% of earned compensation. An actuary determines the actuarial implications of the funding requirement in biennial actuarial valuations. The actuarial method used to determine the implications of the statutory funding level is the entry age normal funding method, with both normal cost and amortization of the accrued liability determined as a level percentage of payroll. The actuarial valuation prepared as of July 1, 1998, the most recent valuation date, indicates the statutory rate was sufficient to fund the normal cost and to amortize the unfunded accrued liability under the entry age normal method over years. During fiscal years 1999 and 1998, no changes were made in the method used to calculate or establish contribution requirements, nor were there any changes in the law affecting benefits.

NOTE D. ADMINISTRATIVE EXPENSES

Administrative expenses for the years ended June 30, 1999 and 1998, are outlined below:

	1999	1998
Personal Services:		
Salaries	$366,515	$341,200
Other compensation	2,450	2,600
Employee benefits	93,870	86,215
Total Personal Services	$462,835	$430,015
Operating Expenses:		
Contracted services	$266,324	$184,652
Supplies and materials	34,929	71,438
Communications	37,801	33,942
Travel	14,574	29,109
Rent	25,884	25,618
Repair and maintenance	22,276	25,014
Other expenses	15,889	28,840
Interest Expense*	384,386	0
Depreciation	19,300	4,141
Amortization	76,462	48,683
Total Operating Expenses	$897,825	$451,437
Total Administrative Expense	$1,360,660	$881,452

*Interest paid to Department of Administration on 6.5million interentity loan for fiscal year end 97 retired payroll. The interest payment is an offset to investment earnings from 7/97 to 7/98.

NOTE E. INSTALLMENT PURCHASE PAYABLE

During fiscal year 1999, TRS contracted for a new data processing system. Seven annual payments of $431,944.01 begin on May 1, 2000 and concluded May 1, 2006, for a total debt of $3,023,608.07 which includes principal and interest of $2,500,000.00 and $523,608.07 respectively. The debt is recorded as services are rendered for a total Installment Purchase Payable of $227,068 as of June 30, 1999.

Year 2000 Issue

The Year 2000 (Y2K) compliance issue refers to the fact that many computer programs use only the last two digits to identify a year. For example, both 1900 and 2000 will be referred to as "00". If not corrected, many programs may not be able to distinguish between the year 2000 and year 1900. Another potential complication relates to the leap-year calculation in year 2000.

TRS has been addressing the Y2K compliance issue relating to its computer system since 1992. The process involved identifying potential issues with the computer system, making compliance changes, testing and validating those changes for all aspects of the retirement system including contributions and benefit payments. The Teachers' Retirement System has completed the testing and validating phase and does not anticipate incurring material additional costs related to year 2000 compliance.

Because of the unprecedented nature of the Y2K issue, its effects and success of related remediation efforts will not be fully determinable until the year 2000 and thereafter. TRS cannot assure that the system is or will be Y2K ready, that the remediation efforts will be successful in whole or in part, or the parties with whom the system does business with will be Y2K compliant.

Teachers' Retirement System
Component Unit of the state of Montana
Required Supplementary Information

Schedule of Funding Progress
(All dollar amounts in thousands)

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liabilities (AAL)[1]	Unfunded Actuarial Accrued Liabilities (UAAL)[2]	Funded Ratio[3]	Covered Payroll[4]	UAAL as a Percentage of Covered Payroll
July 1, 1992	$ 954,542	$ 1,533,883	$ 579,341	62.2%	$ 465,063	124.6%
July 1, 1994	1,157,512	1,712,933	555,421	67.6	472,860	117.5
July 1, 1996	1,376,716	1,939,569	562,853[5]	71.0	501,516	112.2
July 1, 1998[6]	1,809,037	2,123,290	314,253	85.2	529,795	59.3
July 1, 1998[7]	1,809,037	2,342,690	533,653	77.2	529,795	100.7

(1) Actuarial present value of benefits less actuarial present value of future normal costs based on entry age actuarial cost method.

(2) Actuarial accrued liabilities less actuarial value of assets.

(3) Funded ratio is the actuarial value of assets expressed as a percentage of the actuarial accrued liabilities. Generally, the higher the funded ratio the stronger the stability of the system.

(4) Covered Payroll includes compensation paid to all active employees on which contributions are calculated.

(5) UAAL is the excess of the actuarial accrued liabilities over the actuarial value of assets expressed as a percentage of covered payroll. Generally, as the UAAL ratio decreases, the stronger the stability of the system.

(6) Results of July 1, 1998 Actuarial Valuation

(7) July 1, 1998 results adjusted for 1.5% GABA and $500 minimum benefit for legislation which passed in April 1999 and the new salary scale adopted in November 1998.

Teachers' Retirement System
Component Unit of the state of Montana
Required Supplementary Information

Schedule of Contributions from the Employer and Other Contributing Entities
(All dollar amounts in thousands)

Fiscal Year Ending	Covered Employee Payroll [1]	Actual Employer Contributions [2]	Actual Employer Contribution % [2]	Annual Required Contribution (ARC) % [3]	Percentage of ARC Contributed
6/30/94	$472,860	$39,164	7.4645% [4]	7.4645% [4]	100%
6/30/95	486,809	39,073	7.47	7.47	100
6/30/96	501,516	40,627	7.47	7.47	100
6/30/97	511,934	41,640	7.47	7.47	100
6/30/98	529,795	44,476	7.47	7.47	100
6/30/99	543,071	44,987	7.47	7.47	100

(1) Computed as the dollar amount of the actual employer contribution made as a percentage of payroll divided by the contribution rate expressed as a percentage of payroll.

(2) The actual and required employer contributions are expressed as a percentage of payroll. Contributions for termination pay are included in the actual employer contribution, but are not made as a set percentage of payroll. Contributions made as a percentage of the salaries of the members in the Optional Retirement Plan (ORP) are included. In the Fiscal Year ended June 30, 1999, $2.1 million was contributed based on ORP member salaries. The ORP contribution rate varies from year to year.

(3) All employer contributions are a percentage of actual payroll. Thus, as long as the percentage equals the percentage required by the most recent actuarial valuation, the dollar amount of the Annual Required Contributions (ARC) is equal to the actual dollar amount of the required employer contributions.

(4) The employer contribution rate changed from 7.459% to 7.470% of pay at January 1, 1994. 7.4645% is the average of those rates.

Actuarial Cost Method

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The normal cost was first calculated for each individual member. The normal cost rate was defined to equal the total of the individual normal costs, divided by the total pay rate as of July 1, 1998.

The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the unfunded actuarial liability. The unfunded actuarial liability is amortized as a level percentage of the projected salaries of present and future members of the System.

Valuation of Assets - Actuarial Basis

The difference between the total market value of assets and the cost value of assets is added to the cost value on a 3-year smoothed basis.

Investment Earnings

The annual rate of investment earnings of the assets of the System is assumed to be 8% per year, compounded annually.

Postretirement Benefit Increases

No future postretirement benefit increases are assumed.

Inflationary factor

Assumed at 6%.

Factors that significantly affect the identification of trends

No significant factors.

Future Salaries

The composite rate of future salary increases is assumed to be 6% per year, compounded annually. This is the sum of a 5% general wage increase assumption and an assumption of 1% individual salary increase due to promotion and longevity. Adopted July 1, 1998.

Amortization Period

The current employer contribution rate, 7.47% of members salaries, is sufficient to meet the actuarial cost of the System accruing at the valuation date and to amortize the unfunded actuarial liability over 9.2 years. The actuarial costs are calculated using the entry age actuarial cost method.

The 1998 actuarial valuation indicates that a substantial actuarial gain occurred during the preceding two fiscal years. The gain is primarily due to higher returns on the market value of assets than expected, as is reflected in the 19.4% and 16.6% net investment return on a market value basis and 14.9% and 16.0% on an actuarial basis for the past two years. The effect of the asset gain and other experience on the open amortization period can be distributed approximately as follows:

Amortization Period Remaining at July 1, 1998

July 1, 1996 Valuation Amortization Period		27.2 years
Passage of Time		<2.0>
Effect of Changes in Benefits and Contribution Rates		none
Effect of Changes in Actuarial Assumptions		<0.7>
Effect of Increased ORP Contributions		<1.9>
Expected Amortization Period		22.6 years
Effect of Actuarial Experience Gains and Losses:		
Investments (Gain)	<13.7>	
Loss from Other Causes	+0.3	<13.4>
Actual Amortization Period Remaining at July 1, 1998		+ 9.2 years

Guaranteed Annual Benefit Adjustment (GABA)

House Bill 72, passed by the 1999 legislature, effective July 1, 1999, provided for a GABA of 1.5%, paid each January to all retirees who have been retired for at least 36 months. This legislation also provided for a one-time ad hoc $500 minimum benefit adjustment for any retiree who retired with at least 25 or more years of creditable service and on July 1, 1999 was receiving less than $500 per month. Based on the July 1, 1998 actuarial valuation, the unfunded actuarial liabilities increased from $314.3 million to $533.7 million and the amortization period increased form 9.2 years to 26.0 years. The employee contribution rate was also increased from 7.044% to 7.15% and a State General Fund contribution of 0.11% was created. The employer contribution rate remained unchanged

ACTUARIAL SECTION

ANALYSIS OF VALUATION

1. SUMMARY OF THE FINDINGS
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Teachers' Retirement System
State of Montana

Section 1

Summary of the Findings

As a result of the actuarial valuation of the benefits in effect under the Montana Teachers' Retirement System as of July 1, 1998, we recommend that the current employer contribution rate, 7.47% of members' salaries, remain in effect.

This rate is sufficient to meet the actuarial cost of the System accruing at the valuation date and to amortize the unfunded actuarial liability over 9.2 years. The actuarial costs are calculated using the entry age actuarial cost method.

The 1998 actuarial valuation indicates that a substantial actuarial gain occurred during the preceding two fiscal years. The gain is primarily due to higher returns on the market value of assets than expected, and is reflected in the 19.4% and 16.6% net investment return on a market value basis and 14.9% and 16.0% on an actuarial basis for the past two years. These asset gains are much more pronounced than the asset gains reflected in the July 1, 1996 valuation. The following chart compares the annual returns for the past four years.

Year	Market Return	Actuarial Return	Actuarial Return over 8.0% Assumption
7/1/94 to 6/30/95	15.7%	8.9%	0.9%
7/1/95 to 6/30/96	12.4%	10.4%	2.4%
7/1/96 to 6/30/97	19.4%	14.9%	6.9%
7/1/97 to 6/30/98	16.6%	16.0%	8.0%

Asset gains result when the return on the actuarial value of assets exceeds the actuarial investment return assumption of 8.0%. The actuarial return on assets has exceeded the assumption by a total of approximately 15% (6.9% + 8.0%) in the last two years as shown in the last column of the chart. In contrast, the actuarial return on assets in the two years preceding the July 1, 1996 valuation exceeded the assumption by a total of a little over 3% (0.9% + 2.4%). The asset gains in the last two years reduced the unfunded actuarial liability (UAL) by about $228 million. Without the asset gains the UAL would be closer to $542 million instead of the $314 million shown in this report.

The results include changes to the salary increase assumptions as detailed in our Investigation of Economic Experience, dated August 27, 1997. The July 1, 1996 Actuarial Valuation assumed general wage increases of 6.0% and individual increases due to merit and longevity of 0.5% for a total assumed individual increase of 6.5%. The July 1, 1998 Actuarial Valuation assumes general wage increases of 5.0% and individual increases due to merit and longevity of 1.0% for a total of 6.0%.

The effect of the asset gains and other experience on the amortization period can be distributed approximately as follows:

Amortization Period Remaining at July 1, 1998

July 1, 1996 Valuation Amortization Period		27.2 years
Passage of time		– 2.0
Effect of Changes in Benefits and Contribution Rates		none
Effect of Changes in Actuarial Assumptions		– 0.7
Effect of Increased ORP Contributions		– 1.9
Expected Amortization Period at July 1, 1998		22.6 years
Effect of Actuarial Experience Gains and Losses:		
Investments (Gain)	–13.7	
Loss from Other Causes	+ 0.3	– 13.4
Actual Amortization Period Remaining at July 1, 1998		+ 9.2 years

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Section 2

Scope of the Report

This report presents the actuarial valuation of the Montana Teachers' Retirement System as of July 1, 1998.

A summary of the findings resulting from this valuation is presented in the previous section. Section 3 describes the assets of the System. A summary of the assets is set forth in Tables 1, 2 and 3. Sections 4 and 5 describe how the obligations of the System are to be met under the actuarial cost method in use. Section 6 discloses actuarial information based on the requirements of Statement No. 25 of the Governmental Accounting Standards Board.

The actuarial procedures and assumptions used in this valuation are described in Appendix A. The current benefit structure, as determined by the provisions of the governing law on July 1, 1998, is summarized in Appendix B. Schedules of valuation data classifying the data used in the valuation by various categories of contributing members, former contributing members, and beneficiaries make up Appendix C. Appendix D provides a brief summary of the System's recent experience. Comparative statistics are presented on the System's membership and contribution rates. Appendix E is a glossary of actuarial terms used in this report.

In preparing our report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. The participant data used for the valuation were submitted by the staff on computer disks. In our examination of these data, we found them to be reasonably consistent and comparable with data used in prior valuations.

We believe the actuarial assumptions used in the valuation, as summarized in Appendix A, are reasonably related to the experience of the System. The assumptions are the same as those used in our July 1, 1996 actuarial valuation, with the exception of the general wage and individual salary increase assumptions. That assumption was revised to be consistent with those recommended in our August 27, 1997 economic assumptions study report and was adopted by the Board for the July 1, 1998 actuarial valuation. The revised assumptions represent our best estimate of future conditions affecting the System.

In choosing the assumptions and preparing this report, we have conformed to generally recognized and accepted actuarial principles and practices that are consistent with the principles prescribed by the Actuarial Standards Board (ASB) and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.

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Section 3

Assets

In many respects, an actuarial valuation can be regarded as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is July 1, 1998. On that date the assets available for the payment of benefits are appraised. These assets are compared with the actuarial liabilities, which are generally well in excess of the assets. The actuarial process thus leads to a method of determining what contributions by members and their employers are needed to strike a balance.

For the July 1, 1989 valuation, the prior actuary adopted a new asset valuation method based on a three-year smoothing between the System's cost value and market value. The same method, except using a four-year smoothing period, is currently being used by the Montana Public Employee Retirement System. We recommend that the current smoothing method be retained for the July 1, 1998 valuation, but reviewed for reasonableness before the July 1, 2000 valuation.

The total assets of the System are reduced by a minor portion that is set aside for the payment of current liabilities. The resulting net assets equal the total fund balance available for the payment of benefits.

Table 1 summarizes the actuarial value of the net assets available for benefits on the valuation date. The actuarial value of net assets is 90.0% of the market value as of July 1, 1998.

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Table 1

Determination of Actuarial Value of Assets

Valuation Date	Total Fund Balances: Cost Value	Total Fund Balances: Market Value	Cumulative Unrealized Gain	Increase During Year	Smoothing Weights	Smoothed Portions of Gain
July 1, 1996	$1,143,883,484	$1,463,050,516	$ 319,167,032	$ 319,167,032	100.00%	$ 319,167,032
July 1, 1997	1,207,551,557	1,735,370,004	527,818,447	208,651,415	66.67	139,100,943
July 1, 1998	1,285,483,342	2,009,159,213	723,675,871	195,857,424	33.33	65,285,808
						$ 523,553,783

Actuarial Assets

July 1, 1998 Cost Value	$1,285,483,342
Smoothed Portion of Gain	523,553,783
July 1, 1998 Actuarial Value	$1,809,037,125

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Section 4

Actuarial Liabilities

In the previous section, an actuarial valuation was related to an inventory process, and an analysis was given of the inventory of assets of the System as of the valuation date, July 1, 1998. In this section, the discussion will focus on the commitments of the System, which will be referred to as its actuarial liabilities.

Table 2 contains an analysis of the actuarial present value of all future benefits for contributing members, for former contributing members, and for beneficiaries. The analysis is given by type of benefit and by sex.

The actuarial liabilities summarized in Table 2 include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes a measure of both benefits already earned and future benefits to be earned. Thus, for all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and, if an optional benefit is chosen, for the lives of their surviving beneficiaries.

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Table 2

Actuarial Present Value of Future Benefits for Contributing Members, Former Contributing Members, and Beneficiaries

(All amounts are actuarial present values in millions)

	July 1, 1998			July 1, 1996
	Male	Female	Total	Total
A. Active members				
Service retirement	$ 576.1	$ 792.6	$1,368.7	$1,324.4
Disability retirement	11.2	18.8	30.0	29.3
Survivors' benefits	31.3	15.1	46.4	46.2
Vested Retirement	9.9	20.2	30.1	32.0
Refund of Member Contributions	12.5	22.4	34.9	37.5
Total	$ 641.0	$ 869.1	$1,510.1	$1,469.4
B. Inactive members and annuitants				
Service retirement	$ 516.8	$ 346.7	$ 863.5	$ 756.2
Disability retirement	5.8	8.2	14.0	113.7
Beneficiaries*	8.7	49.6	58.3	52.8
Vested terminated members	12.4	19.2	31.6	29.2
Nonvested terminated members	3.7	8.8	12.5	10.5
Total	$ 547.4	$ 432.5	$ 979.9	$ 862.4
C. Grand Total	$1,188.4	$1,301.6	$2,490.0	$2,331.8

**Includes survivors of active and retired members, and children's benefits.*

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Section 5

Employer Contributions

In the previous two sections, attention has been focused on the assets and actuarial liabilities of the System. A comparison of Tables 1 and 2 indicates that there is a shortfall in current actuarial assets to meet the total actuarial liabilities. This is the universal experience in all but a fully closed-down fund where no further contributions of any sort are anticipated.

In an active system, there will always be a difference between the actuarial liabilities and the assets. This difference has to be funded with future contributions and investment returns. An actuarial valuation sets a schedule of future contributions that will deal with this funding in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. For this valuation, the entry age actuarial cost method has been used. Under this method, or essentially any actuarial cost method, the contributions required to meet the difference between current assets and current actuarial liabilities are allocated each year between two elements:

- A normal cost amount, which ideally is relatively stable as a percentage of salary over the years; and

- Whatever amount is left over, which is used to amortize what is called the unfunded actuarial liability.

The two items described above, normal cost and unfunded actuarial liability, are the keys to understanding the actuarial cost method. Let us first discuss the normal cost.

The normal cost is the theoretical contribution rate which will meet the ongoing costs of a group of average new employees. Suppose that a group of new employees were covered under a separate fund from which all benefits and to which all contributions and associated investment return were to be paid. Under the entry age actuarial cost method, the normal cost contribution rate is that level percentage of pay which would be exactly right to maintain this fund on a stable basis. If experience were to follow the actuarial assumptions exactly, the fund would be completely liquidated with the last payment to the last survivor of the group.

We have determined the normal cost rates separately by type of employee and by type of benefit under the System. These are summarized in Table 3. The normal costs as of July 1, 1996 and July 1, 1998 include .031% to fund the additional cost of the changes to the Vietnam service credit.

The term "fully funded" is often applied to a system where contributions for everyone at the normal cost rate will fully pay for the benefits of existing as well as new employees. More often than not, systems are not fully funded, either because of benefit improvements in the past that have not been completely paid for or actuarial deficiencies that have occurred because experience has not been as favorable as anticipated. Under these circumstances, an unfunded actuarial liability (UAL) exists.

Table 4 shows how the UAL was derived for the System. Lines A and B show, respectively, the total present value of future benefits and the portion of the future liability that is expected to be paid from future normal cost contributions, both employer and employee. Line C shows the actuarial liability: the portion of the present value of future benefits not provided by future normal cost contributions. Line D shows the actuarial value of assets available for benefits. Finally, Line E shows the unfunded actuarial liability.

As can be seen from this discussion, a key consideration in the adequacy of the funding of the System is how the UAL is being amortized. Table 5 shows that the current employer and member contribution rates are adequate to pay the total normal cost rate (8.880% of pay), with enough left over to amortize the UAL in 9.2 years. Therefore, the current basis is sufficient to meet future requirements.

The amortization of the UAL assumes contributions made as a percent of pay for members of the Optional Retirement Plan (ORP) until June 30, 2033. The July 1, 1996 Teachers' Retirement System (TRS) valuation assumed continued contributions of 2.503% of pay through June 30, 2027 for ORP members. The July 1, 1996 Montana University System (MUS) Valuation found the 2.503% rate to be insufficient to pay off the MUS unfunded actuarial liability by June 30, 2033. The rates have been revised for the July 1, 1998 TRS valuation to be consistent with the results of the July 1, 1996 MUS actuarial valuation. The MUS valuation was required by MCA, Section 19-21-203. The July 1, 1996 MUS valuation projected $98.0 million in additional UAL on July 1, 1997 due to present and former MUS members. This "additional" UAL is the amount that would not be paid for by the future contributions of MUS members. The level % of future ORP salaries from July 1, 1997 through June 30, 2033 necessary to pay for this UAL was 3.97%. Subsequent to the MUS valuation, the following graded schedule for increasing the ORP contributions was adopted:

ORP Contribution Rate	**Fiscal Years Ending**
2.81%	June 30, 1998
3.12%	June 30, 1999
3.42%	June 30, 2000
3.73%	June 30, 2001
4.04%	June 30, 2002 to June 30, 2033

The value of future ORP payments included in the July 1, 1998 TRS valuation is $90.6 million. This value is less than previously expected due to the change in valuation assumptions. Future general wage increases are now assumed to be 5.0% per year instead of 6.0%. In addition to the 5.0% general wage increase assumption, individual salaries are assumed to increase by 1.0% due to merit and longevity.

The recent asset gains and assumption changes will both have an impact on the MUS as well as the TRS. We therefore recommend the ORP contribution rates be reviewed with the July 1, 2000 Actuarial Valuation. This is consistent with MCA, Section 19-20-621 which prescribes periodic valuations to determine appropriate ORP contribution rates.

The unfunded actuarial liability at any date after establishment of a system is affected by any actuarial gains or losses arising when the actual experience of the system varies from the experience anticipated by the actuarial assumptions used in the valuations. To the extent actual experience as it develops differs from the assumptions used, so also will the actual emerging costs differ from the estimated costs.

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Table 3

Normal Cost Contribution Rates
As Percentages of Salary

	July 1, 1998			July 1, 1996
	Male	Female	Total	Total
Service retirement	5.31%	6.62%	6.09%	6.46%
Disability retirement	0.17	0.24	0.21	0.22
Survivors' benefits	0.39	0.17	0.26	0.28
Vested retirement	0.52	0.55	0.54	0.55
Refund of member contributions	1.94	1.67	1.78	1.82
Total	8.33%	9.25%	8.88%	9.33%

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Table 4

Unfunded Actuarial Liability
(All dollar amounts in millions)

	July 1, 1998	July 1, 1996
A. Actuarial present value of all future benefits for present and former members and their survivors (Table 2)	$ 2,490.0	$ 2,331.8
B. Less actuarial present value of total future normal costs for present members	366.7	392.2
C. Actuarial liability	$ 2,123.3	$ 1,939.6
D. Less actuarial value of assets available for benefits (Table 1)	1,809.0	1,376.7
E. Unfunded actuarial liability	$ 314.3*	$ 562.9

**Of this amount, approximately $90.6 million will be paid by contributions to TRS made as a percentage of the salaries of the participants in the Optional Retirement Plan (ORP). The percentage of salary will be 3.12%, 3.42% and 3.73% for the Fiscal Years ending in 1999, 2000 and 2001 respectively. The percentage of salary will be a level 4.04% for the Fiscal Years ending in 2002 through 2033.*

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Table 5

Recommended Contribution Rates
As Percentages of Salary

	July 1, 1998	July 1, 1996
A. Employer contribution rate	7.470%	7.470%
B. Member contribution rate	7.044	7.044
C. Total contribution rate	14.514%	14.514%
D. Less total normal cost rate (Table 3)	8.880	9.328
E. Amount available to amortize unfunded actuarial liability*	5.634%	5.186%
F. Amortization period from Valuation Date	9.2 years	27.2 years**

* *In addition, a percentage of the salaries of the participants in the Optional Retirement Plan (ORP) are available to help amortize the unfunded actuarial liability.*

** *The amortization period as of July 1, 1996 was 27.2 years; thus, the expected period as of July 1, 1998 is 25.2 years.*

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Section 6

Actuarial Information for Accounting Purposes

For fiscal years beginning after June 15, 1996, new GASB reporting standards are required for defined benefit pension plans reporting and disclosures (Statement No. 25). The System adopted the new standards in 1996.

The new reporting requirements for Statement No. 25 include certain supplementary information to the financial statements. These include:

- A schedule of funding progress, and
- A schedule of employer contributions.

The Schedule of Funding Progress compares actuarial assets and liabilities of the System, based on the actuarial funding method used. The required Schedule of Employer Contributions compares the employer contributions required based on the actuarial valuation (the actuarial required contribution, or ARC) with those employer contributions actually made. The ARC must be calculated based on certain parameters required for disclosure purposes. We believe the current actuarial methods and assumptions used in this valuation to determine the employer's contribution for funding purposes satisfy the new GASB reporting requirements.

GASB Statement No. 27 is effective for fiscal years beginning after June 15, 1997, for pension accounting by state and local governmental employers. The System is a cost sharing multiple employer defined benefit pension plan, so the only disclosures required by the new Statement No. 27 by employers is a description of the pension plan and the funding policy adopted to fund the plan benefits, including the required contribution rates.

The comparability of the data from year to year can be affected by changes in actuarial assumptions, benefit provisions, accounting policies, etc. The actuarial assumptions were revised in each of the last three actuarial valuations: July 1, 1994, 1996 and 1998.

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Table 6

Schedule of Funding Progress
(All dollar amounts in thousands)

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liabilities (AAL)[1]	Unfunded Actuarial Accrued Liabilities (UAAL)[2]	Funded Ratio	Covered Payroll[3]	UAAL as a Percentage of Covered Payroll
July 1, 1992	$ 954,542	$ 1,533,883	$ 579,341	62.2%	$ 465,063	124.6%
July 1, 1994	1,157,512	1,712,933	555,421	67.6	472,860	117.5
July 1, 1996	1,376,716	1,939,569	562,853[4]	71.0	501,516	112.2
July 1, 1998[5]	1,809,037	2,123,290	314,253	85.2	529,795	59.3
July 1, 1998[6]	1,809,037	2,342,690	533,653	77.2	529,795	100.7

(1) Actuarial present value of benefits less actuarial present value of future normal costs based on entry age actuarial cost method.

(2) Actuarial accrued liabilities less actuarial value of assets.

(3) Covered Payroll includes compensation paid to all active employees on which contributions are calculated. Covered Payroll differs from the Active Member Valuation Payroll shown in Table C-1, which is an annualized compensation of only those members who were active on the actuarial valuation date.

(4) Note that although the UAAL increased from 1994 to 1996, the Covered Payroll increased more. Therefore, both the UAAL as a Percentage of Covered Payroll and the amortization period for the UAAL decreased.

(5) Results of July 1, 1998 Actuarial Valuation.

(6) July 1, 1998 results adjusted for 1.5% GABA and $500 minimum benefit for legislation which passed in April 1999 and the new salary scale adopted in November 1998.

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Table 7

Solvency Test
(All dollar amounts in thousands)

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liabilities for (A) Active Member Contributions	(B) Retirees and Beneficiaries	(C) Active Members (Employer Financed Portion)	Portion of Actuarial Accrued Liabilities Covered by Assets (A)	(B)	(C)
July 1, 1992	$ 954,542	$ 407,441	$ 622,016	$ 504,426	100.0%	88.0%	0.0%
July 1, 1994	1,157,512	459,776	768,570	484,587	100.0	90.8	0.0
July 1, 1996	1,376,716	541,440	862,384	535,745	100.0	96.9	0.0
July 1, 1998	1,809,037	603,614	979,954	539,722	100.0	100.0	41.8%

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Table 8

Schedule of Contributions from the Employer and Other Contributing Entities
(All dollar amounts in thousands)

Fiscal Year Ending	Covered Employee Payroll [1]	Actual Employer Contributions [2]	Actual Employer Contribution % [2]	Annual Required Contribution (ARC) % [3]	Percentage of ARC Contributed
6/30/94	$472,860	$39,164	7.4645% [4]	7.4645% [4]	100%
6/30/95	486,809	39,073	7.47	7.47	100
6/30/96	501,516	40,627	7.47	7.47	100
6/30/97	511,934	41,640	7.47	7.47	100
6/30/98	529,795	44,476	7.47	7.47	100
6/30/99	543,071	44,987	7.47	7.47	100

(1) Computed as the dollar amount of the actual employer contribution made as a percentage of payroll divided by the contribution rate expressed as a percentage of payroll.

(2) The actual and required employer contributions are expressed as a percentage of payroll. Contributions for termination pay are included in the actual employer contribution, but are not made as a set percentage of payroll. Contributions made as a percentage of the salaries of the members in the Optional Retirement Plan (ORP) are included. In the Fiscal Year ended June 30, 1999, $2.1 million was contributed based on ORP member salaries. The ORP contribution rate varies from year to year.

(3) The State makes employer contributions as a percentage of actual payroll. Thus, as long as the percentage equals the percentage required by the most recent actuarial valuation, the dollar amount of the Annual Required Contributions (ARC) is equal to the actual dollar amount of the required employer contributions.

(4) The employer contribution rate changed from 7.459% to 7.470% of pay at January 1, 1994. 7.4645% is the average of those rates.

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Appendix A

Actuarial Procedures and Assumptions

The actuarial assumptions used in this valuation were adopted by the Board for the July 1, 1998 Actuarial Valuation. The salary increase assumptions were changed as a result of our Investigation of Economic Experience, dated August 27, 1997. These assumptions are summarized in Table A-1.

Tables A-2 through A-5 give rates of decrement for service retirement, disablement, mortality, and other terminations of employment. These rates of decrement are referred to in actuarial literature as the absolute rate of decrement, or q'_x. Table A-6 shows the assumed probability of immediate refund of contributions among members terminating with five or more years of service.

Actuarial Cost Method

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The normal cost was first calculated for each individual member. The normal cost rate was defined to equal the total of the individual normal costs, divided by the total pay rate as of July 1, 1998.

The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the unfunded actuarial liability. The unfunded actuarial liability is amortized as a level percentage of the projected salaries of present and future members of the System.

Records and Data

The data used in the valuation consist of financial information; records of age, sex, service, salary, contribution rates, and account balances of contributing members; and records of age, sex, and amount of benefit for retired members and beneficiaries. All of the data were supplied by the System and are accepted for valuation purposes without audit.

Replacement of Terminated Members

The ages at entry and distribution by sex of future members are assumed to average the same as those of the present members they replace. If the number of active members should increase, it is further assumed that the average entry age of the larger group will be the same, from an actuarial standpoint, as that of the present group. Under these assumptions, the normal cost rates for active members will not vary with the termination of present members.

Employer Contributions

At the time of this valuation, the total employer contribution rate for normal costs and amortization of the unfunded actuarial liability was 7.470% of members' salaries.

Administrative Expense

The administrative expenses of the System are assumed to be funded by investment earnings in excess of 8% per year.

Valuation of Assets - Cost Basis

Bonds:	Bonds are valued at amortized book value.
Mortgages:	Mortgages are valued at par value.
Common Stocks:	Each issue of common stock is valued at cost.
Other Assets:	Other assets are carried on a book (cost) basis.

Premiums and discounts are amortized using the straight-life method over the life of the securities (8 years for mortgages).

Valuation of Assets - Actuarial Basis

The difference between the total market value of assets and the cost value of assets is added to the cost value on a 3-year smoothed basis.

Investment Earnings

The annual rate of investment earnings of the assets of the System is assumed to be 8% per year, compounded annually.

Interest on Member Contributions

Interest on member contributions is assumed to accrue at a rate of 6% per annum, compounded annually. This assumption was set as of July 1, 1998.

Postretirement Benefit Increases

No future postretirement benefit increases are assumed.

Future Salaries

The composite rate of future salary increases is assumed to be 6.0% per year, compounded annually. This is the sum of a 5.0% general wage increase assumption and an assumption of 1.0% individual salary increase due to promotion and longevity. This assumption was adopted July 1, 1998.

Service Retirement

Table A-2 shows the annual assumed rates of retirement among members eligible for service retirement. Separate rates are used when a member is eligible for reduced benefits, for the first year a member is eligible for full benefits, and for the years following the first year a member is eligible for full benefits. The rates for General Members were adopted July 1, 1994. The rates for University Members were adopted July 1, 1996.

Disablement

The rates of disablement used in this valuation are illustrated in Table A-3. These rates were adopted July 1, 1996.

Mortality

The mortality rates used in this valuation are illustrated in Table A-4. A written description of each table used is included in Table A-1.

Other Terminations of Employment

The rates of assumed future withdrawal from active service for reasons other than death, disability or retirement are shown for representative ages in Table A-5. These rates were adopted July 1, 1996.

Benefits for Terminating Members

Members terminating with less than five years of service are assumed to request an immediate withdrawal of their contributions with interest. Table A-6 shows the assumed probability of immediate refund of contributions among members terminating with five or more years of service. These rates were adopted July 1, 1996.

The data provided for some of the current terminated vested members included their accrued benefit. We calculated the present value of future benefits for these members and compared it with their available contribution account and took the larger value. We then estimated the present value of future benefits for all other terminated vested members based on their available contribution account.

Part-Time Employees

The valuation data for active members identify part-time members, but give no indication as to the number of hours worked. As done in the past, we imputed a "part-time percentage" by comparing the pay received with their annual equivalent full-time salary. Part-time members earning less than $1,000 during the last year were valued at their current member contribution balance.

Optional Retirement Program

The total contribution received based on ORP payroll for the fiscal year ending June 30, 1998 was $1,782,307. Based on a contribution rate of 2.81%, we assumed the total ORP payroll for the fiscal year to be $63,427,295 ($1,782,307 divided by 2.81%).

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Table A-1

Summary of Valuation Assumptions
(July 1, 1998)

I.	Economic assumptions	
	A. General wage increases*	5.00%
	B. Individual salary increase due to promotion and longevity	1.00%
	C. Investment return	8.00%
	D. Growth in membership	0.00%
	E. Postretirement benefit increases	0.00%
	F. Interest on member accounts	6.00%
II.	Demographic assumptions	
	A. Retirement (General Member assumptions adopted July 1, 1994) (University Member assumptions adopted July 1, 1996)	Table A-2
	B. Disablement (adopted July 1, 1996)	Table A-3
	C. Mortality among contributing members 1983 Group Annuity Mortality (GAM) Table, with ages set back two years	Table A-4
	D. Mortality among service retired and disabled members and beneficiaries 1983 GAM Table, with ages set back one year.	Table A-4
	E. Other terminations of employment (adopted July 1, 1996)	Table A-5
	F. Probability of retaining membership in the System upon vested termination (adopted July 1, 1996)	Table A-6

**Montana University System (MUS) members are assumed to have a 0.63% higher average final compensation due to extra service near retirement.*

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Table A-2

Retirement

Annual Rates

	General Members			University Members		
Age	Eligible for Reduced Benefits	First Year Eligible for Full Benefits	Thereafter	Eligible for Reduced Benefits	First Year Eligible for Full Benefits	Thereafter
50	5.0%	15.4%	10.0%	2.5%	9.5%	4.9%
51	5.3	15.6	10.0	2.7	9.5	4.9
52	5.6	15.8	10.0	3.0	9.5	6.8
53	6.0	16.1	10.0	3.2	9.5	6.8
54	6.3	16.4	10.0	3.4	14.0	6.8
55	6.7	16.9	12.5	3.7	15.7	6.8
56	7.1	17.5	12.5	4.2	18.2	6.8
57	7.6	18.2	12.5	4.4	18.6	7.7
58	8.0	19.2	12.5	4.9	19.2	8.6
59	8.5	20.4	12.5	5.4	20.4	10.4
60	*	22.0	20.0	*	22.0	12.2
61		22.0	20.0		22.0	14.0
62		22.0	20.0		22.0	18.2
63		22.0	20.0		22.0	14.0
64		22.0	20.0		22.0	18.2
65		22.0	20.0		22.0	26.1
66		22.0	20.0		22.0	22.2
67		22.0	20.0		22.0	22.2
68		22.0	20.0		22.0	22.2
69		22.0	20.0		22.0	22.2
70		**	**		**	**

**All benefits are unreduced after attaining age 60.*
***Immediate retirement is assumed at age 70 or over.*

Teachers' Retirement System
State of Montana

Table A-3

Disablement

Annual Rates

Age	General Members	University Members
25	.009%	.003%
30	.018	.006
35	.036	.012
40	.063	.021
45	.108	.036
50	.164	.055
55	.248	.083
60	.377	.126

Teachers' Retirement System
State of Montana

Table A-4

Mortality

Annual Rates*

Age	Men	Women
25	.05%	.03%
30	.06	.03
35	.09	.05
40	.12	.07
45	.22	.10
50	.39	.16
55	.61	.25
60	.92	.42
65	1.56	.71
70	2.75	1.24
75	4.46	2.40
80	7.41	4.29
85	11.48	6.99

**Rates shown are set back one year for retirees and two years for active members.*

Teachers' Retirement System
State of Montana

Table A-5

Other Terminations of Employment
Among Members Not Eligible to Retire

Annual Rates

Age	General and University Members
25	22.22%
30	13.95
35	8.30
40	5.84
45	4.19
50	3.60
55	3.02
60	2.67

Teachers' Retirement System
State of Montana

Table A-6

Probability of Retaining Membership in the System
Upon Vested Termination

Age	Probability of Retaining Membership
25	60%
30	60
35	60
40	60
45	63
50	71
55	75

Teachers' Retirement System
State of Montana

Appendix B

Summary of Benefit Provisions

Effective Date	September 1, 1937
Vesting Period	5 years. No benefits are payable unless the member has a vested right, except the return of employee contributions with interest.
Final Compensation	Average of highest 3 consecutive years of earned compensation.
Normal Form of Benefits	Life only annuity. All benefits cease upon death; however, in no event will the member receive less than the amount of employee contributions with interest.
Normal Retirement Benefits	
Eligibility:	25 years of service or age 60 and 5 years of service.
Benefit:	The retirement benefit is equal to 1/60 of final compensation for each year of service.
Early Retirement Benefits	
Eligibility:	5 years of service and age 50.
Benefit:	The retirement benefit is calculated in the same manner as described for normal retirement, but the benefit is reduced 1/2 of 1% for each of the first 60 months early and 3/10 of 1% for each of the next 60 months early.

Death Benefit	
Eligibility:	5 years of service.
Benefit:	The death benefit is equal to 1/60 of final compensation for each year of service accrued at date of death, with an actuarial adjustment based on the relation of the member's age at death to the beneficiary's age. A monthly benefit of $200 is paid to each child until age 18. In addition, a lump-sum benefit of $500 is paid upon the death of an active or retired member.
Disability Benefit	
Eligibility:	5 years of service.
Benefit:	The disability benefit is equal to 1/60 of final compensation for each year of service accrued at date of disability. The minimum benefit is 1/4 of the final compensation.
Withdrawal Benefits	With less than 5 years of service, the accumulated employee contributions with interest are returned. With more than 5 years, the member may elect a refund of contributions with interest or leave the contributions and interest in the System and retain a vested right to retirement benefits.
Contributions	Member: 7.044% of compensation. Employer: 7.470% of compensation.
Interest on Member Contributions	Interest on member contributions is currently being credited at a rate of 5.5% per annum.
Cost-of-Living Adjustments	Each year the Board determines if the total investment income earned on the retirement fund for the fiscal year is sufficient to pay a permanent cost-of-living adjustment to certain retired members. If an adjustment is granted, it is considered actuarially funded by the system and is included in the next actuarial valuation in the determination of the actuarially required contribution rates.

Teachers' Retirement System
State of Montana

Appendix C

Valuation Data

This valuation is based upon the membership of the System as of July 1, 1998. Membership data were supplied by the System and accepted for valuation purposes without audit. However, tests were performed to ensure that the data are sufficiently accurate for valuation purposes.

Table C-1 contains summaries of the data for contributing members. For full-time members, values shown in the tables are the numbers of members and their total and average annual salaries. For part-time members, only the numbers of members are shown. All information is shown separately for males and females.

Members	Full-Time Members	Part-Time Members*	Total Contributing Members*	Annual Full-Time Salaries in Thousands
Male	4,944	543	5,487	$ 191,044
Female	8,601	3,328	11,929	268,147
Total	13,545	3,871	17,416	$ 459,191

**Excludes 776 part-time members with salaries under $1,000.*

Table C-2 presents distributions of the following:

- Members receiving service retirement benefits.
- Members receiving disability retirement benefits.
- Survivors of deceased retired members receiving benefits.
- Survivors of deceased active members.
- Child beneficiaries.
- Terminated vested members.**

***The valuation also includes liabilities attributable to members who have terminated employment but have not withdrawn their contributions. There are 8,158 such members who are not vested and 1,190 such members who are vested. These counts include 97 records provided in the active data with salary equal to zero.*

The following is a summary of retired members and beneficiaries currently receiving benefits:

Type of Annuitant	Number	Annual Benefits in Thousands	Average Annual Benefits
Service Retirement			
Male	3,282	$ 52,831	$ 16,097
Female	3,907	37,929	9,708
Disability Retirement			
Male	69	583	8,446
Female	131	832	6,354
Survivors of Deceased Retired Members			
Male	90	497	5,520
Female	473	3,753	7,935
Survivors of Deceased Active Members			
Male	110	506	4,600
Female	261	2,015	7,718
Child Beneficiaries	39	94	2,400
Total Annuitants	8,362	$ 99,040	11,844

Teachers Retirement System - State of Montana
Active Members - Full Time
Distribution Of Employees and Salaries as of July 1, 1998

Number of Employees - By Age Group - Males

Age	Completed Years of Service												
	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
< 25	4	11	2										17
25 to 29	20	105	82	95	33								335
30 to 34	6	42	38	94	244	28							452
35 to 39	7	22	27	60	175	158	54						503
40 to 44	5	15	14	44	145	166	229	76					694
45 to 49	3	25	20	32	120	138	187	369	122				1,016
50 to 54	5	14	15	23	83	86	118	195	450	96			1,085
55 to 59	4	9	9	6	29	39	45	59	150	212	32		594
60 to 64	2	4	1	7	20	22	20	15	31	56	34	1	213
65 to 69		3	2	1	1	4	5	2	1	4	3	3	29
70 and up						1		2	3				6
Totals	56	250	210	362	850	642	658	718	757	368	69	4	4,944

Annual Salaries in Thousands - By Age Group - Males

Age	Completed Years of Service												
	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
< 25	37	242	54										333
25 to 29	155	2,217	1,862	2,367	885								7,486
30 to 34	70	972	942	2,529	7,109	933							12,556
35 to 39	59	503	716	1,705	5,452	5,644	2,083						16,162
40 to 44	50	394	362	1,342	4,828	6,186	9,147	3,161					25,472
45 to 49	28	715	585	945	4,200	5,459	8,026	15,742	5,391				41,091
50 to 54	91	511	559	752	2,886	3,769	5,721	9,151	19,825	4,343			47,607
55 to 59	65	335	313	174	1,132	1,613	2,063	2,806	7,501	10,136	1,545		27,683
60 to 64	19	175	29	206	972	1,063	1,046	728	1,557	3,186	1,806	53	10,842
65 to 69		89	35	29	3	213	260	93	48	217	260	202	1,450
70 and up						53		158	150				361
Totals	575	6,154	5,458	10,049	27,467	24,934	28,345	31,840	34,471	17,883	3,612	255	191,044

Teachers Retirement System - State of Montana
Active Members - Full Time
Distribution Of Employees and Salaries as of July 1, 1998

Average Annual Salary - By Age Group - Males

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
< 25	9,336	21,993	27,020										19,606
25 to 29	7,744	21,119	22,711	24,913	26,815								22,347
30 to 34	11,739	23,138	24,786	26,906	29,135	33,337							27,778
35 to 39	8,435	22,861	26,537	28,411	31,154	35,723	38,572						32,132
40 to 44	10,059	26,284	25,853	30,510	33,297	37,266	39,943	41,598					36,703
45 to 49	9,386	28,596	29,261	29,535	35,000	39,555	42,922	42,662	44,187				40,444
50 to 54	18,118	36,487	37,297	32,703	34,771	43,824	48,482	46,927	44,056	45,236			43,878
55 to 59	16,326	37,258	34,733	29,014	39,020	41,357	45,834	47,565	50,004	47,813	48,293		46,605
60 to 64	9,652	43,756	29,184	29,485	48,615	48,331	52,286	48,503	50,229	56,899	53,126	53,111	50,900
65 to 69		29,727	17,654	28,600	3,260	53,334	51,935	46,744	47,519	54,329	86,652	67,423	49,997
70 and up						52,929		79,164	50,019				60,219
Totals	10,274	24,615	25,992	27,761	32,314	38,837	43,078	44,345	45,537	48,594	52,342	63,845	38,642

Teachers Retirement System - State of Montana
Active Members - Full Time
Distribution Of Employees and Salaries as of July 1, 1998

Number of Employees - By Age Group - Females

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
< 25	14	49	5	1									69
25 to 29	35	159	138	250	114								696
30 to 34	16	63	53	179	435	63							809
35 to 39	16	43	51	113	313	337	120						993
40 to 44	21	51	58	156	342	317	394	111					1,450
45 to 49	20	48	60	120	391	375	379	483	162	1			2,039
50 to 54	11	28	32	56	246	273	240	262	316	72			1,536
55 to 59	2	11	11	16	89	86	130	147	122	99	25		738
60 to 64	1		5	3	22	19	31	52	48	33	16	2	232
65 to 69			1		6	4	2	7	5	6	4	1	36
70 and up					1	1				1			3
Totals	136	452	414	894	1,959	1,475	1,296	1,062	653	212	45	3	8,601

Annual Salaries in Thousands - By Age Group - Females

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
< 25	130	915	87	20									1,152
25 to 29	348	3,074	2,797	5,490	2,674								14,383
30 to 34	151	1,271	1,137	4,129	11,155	1,892							19,734
35 to 39	129	857	1,085	2,658	8,534	10,656	4,258						28,177
40 to 44	136	993	1,322	3,723	9,489	10,166	14,184	4,178					44,192
45 to 49	183	1,089	1,275	2,933	11,168	12,731	13,824	18,790	6,460	36			68,489
50 to 54	116	630	849	1,454	7,422	9,145	9,293	10,283	12,774	2,936			54,902
55 to 59	26	257	223	369	2,642	2,999	4,971	5,807	4,956	4,103	962		27,316
60 to 64	15		98	80	539	710	1,132	1,999	1,889	1,367	652	86	8,567
65 to 69			5		184	110	60	206	184	224	131	37	1,141
70 and up					19	29				47			94
Totals	1,234	9,086	8,878	20,856	53,825	48,437	47,722	41,264	26,263	8,713	1,745	123	268,147

Teachers Retirement System - State of Montana
Active Members - Full Time
Distribution Of Employees and Salaries as of July 1, 1998

Average Annual Salary - By Age Group - Females

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
< 25	9,279	18,675	17,335	20,421									16,697
25 to 29	9,952	19,333	20,266	21,960	23,456								20,665
30 to 34	9,406	20,170	21,458	23,064	25,645	30,031							24,394
35 to 39	8,078	19,922	21,271	23,524	27,266	31,619	35,481						28,375
40 to 44	6,475	19,477	22,791	23,867	27,746	32,070	36,000	37,639					30,477
45 to 49	9,149	22,694	21,247	24,438	28,562	33,950	36,475	38,903	39,878	36,094			33,589
50 to 54	10,578	22,500	26,544	25,965	30,169	33,498	38,720	39,249	40,423	40,778			35,743
55 to 59	13,185	23,379	20,280	23,066	29,686	34,870	38,240	39,501	40,626	41,442	38,498		37,014
60 to 64	14,553		19,662	26,571	24,503	37,358	36,531	38,448	39,361	41,427	40,749	42,939	36,929
65 to 69			4,974		30,587	27,594	29,850	29,496	36,722	37,411	32,715	37,057	31,695
70 and up					18,525	28,709				46,705			31,313
Totals	9,075	20,102	21,444	23,329	27,476	32,839	36,822	38,855	40,219	41,100	38,785	40,978	31,176

Teachers Retirement System - State of Montana
Active Members - Part Time
Distribution Of Employees and Salaries as of July 1, 1998

Number of Employees - By Age Group - Males

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
< 25	14	8	2										24
25 to 29	53	26	10	5	1								95
30 to 34	10	15	9	6	9								49
35 to 39	12	11	6	5	6	6	1						47
40 to 44	11	12	8	5	14	8	1	2					61
45 to 49	12	9	10	10	14	10	10	4	1				80
50 to 54	4	12	5	9	11	11	10	9	9	5			85
55 to 59	6	3	3	5	6	3	4	4	20	7			61
60 to 64	3	3	1	1	2	1	2		1	8	1		23
65 to 69		4	4			1	2			1	1	1	14
70 and up				1		2				1			4
Totals	125	103	58	47	63	42	30	19	31	22	2	1	543

Number of Employees - By Age Group - Females

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
< 25	70	27	7										104
25 to 29	157	99	50	53	21								380
30 to 34	69	38	31	46	64	20							268
35 to 39	90	100	62	95	93	48	35						523
40 to 44	93	103	75	121	149	57	47	34					679
45 to 49	79	73	60	112	214	61	32	33	15				679
50 to 54	27	40	28	59	125	50	17	9	19	3			377
55 to 59	11	6	11	21	56	36	30	14	4	3			192
60 to 64	5	6	6	8	22	15	6	6	5	2	1	1	83
65 to 69	3	4	2	4	4	4	2	5	1				29
70 and up	3		1	2	3	2	2	1					14
Totals	607	496	333	521	751	293	171	102	44	8	1	1	3,328

Total of Above	3,871
Part Time Participants with Salary Less Than $1,000	776
Total Part Time Participants	4,647

Teachers Retirement System - State of Montana
Distribution of Inactive Lives

Members Receiving Service Retirement Benefits as of July 1, 1998

	Number of Persons		Annual Benefits in Thousands		Average Annual Benefits	
Age	Males	Females	Males	Females	Males	Females
<50	23	25	401	434	17,436	17,343
50 to 54	262	182	4,783	2,748	18,255	15,099
55 to 59	513	367	9,393	5,173	18,310	14,096
60 to 64	657	526	12,004	6,963	18,272	13,238
65 to 69	674	588	11,929	6,919	17,698	11,768
70 to 74	499	484	7,172	4,670	14,372	9,648
75 to 79	333	489	4,382	3,887	13,158	7,950
80 to 84	184	497	1,822	3,366	9,902	6,772
85 to 89	84	423	619	2,174	7,370	5,139
90 and up	53	326	327	1,594	6,161	4,891
Total	3,282	3,907	52,831	37,929	16,097	9,708

Members Receiving Disability Retirement Benefits as of July 1, 1998

	Number of Persons		Annual Benefits in Thousands		Average Annual Benefits	
Age	Males	Females	Males	Females	Males	Females
<50	6	17	38	129	6,343	7,577
50 to 54	9	11	73	86	8,122	7,773
55 to 59	12	18	110	122	9,135	6,793
60 to 64	12	16	101	139	8,428	8,671
65 to 69	12	13	106	76	8,864	5,869
70 to 74	8	14	80	90	10,056	6,433
75 to 79	6	13	45	59	7,460	4,545
80 to 84	3	16	18	68	6,163	4,256
85 to 89	1	6	11	29	10,819	4,894
90 and up		7		34		4,875
Total	69	131	583	832	8,446	6,354

Teachers Retirement System - State of Montana
Distribution of Inactive Lives

Survivors of Deceased Retired Members as of July 1, 1998

	Number of Persons		Annual Benefits in Thousands		Average Annual Benefits	
Age	Males	Females	Males	Females	Males	Females
<50	11	12	50	95	4,542	7,895
50 to 54	5	14	28	117	5,555	8,330
55 to 59	5	17	40	157	8,085	9,259
60 to 64	13	44	64	451	4,906	10,242
65 to 69	9	53	75	556	8,316	10,490
70 to 74	8	65	57	625	7,176	9,622
75 to 79	11	91	63	636	5,708	6,992
80 to 84	20	79	80	580	4,019	7,341
85 to 89	3	52	20	286	6,689	5,509
90 and up	5	46	19	250	3,872	5,429
Total	90	473	497	3,753	5,520	7,935

Survivors of Deceased Active Members as of July 1, 1998

	Number of Persons		Annual Benefits in Thousands		Average Annual Benefits	
Age	Males	Females	Males	Females	Males	Females
<50	32	51	116	241	3,619	4,723
50 to 54	12	32	41	276	3,438	8,618
55 to 59	12	27	49	252	4,121	9,317
60 to 64	12	26	76	211	6,310	8,129
65 to 69	7	32	49	319	7,033	9,960
70 to 74	17	33	94	339	5,539	10,267
75 to 79	6	32	32	229	5,259	7,171
80 to 84	7	10	33	45	4,693	4,478
85 to 89	2	13	6	76	3,191	5,871
90 and up	3	5	10	27	3,202	5,367
Total	110	261	506	2,015	4,600	7,718

Teachers Retirement System - State of Montana
Distribution of Inactive Lives

Terminated Vested Members as of July 1, 1998
Number of Persons

Age	Males	Females	Total
<25	0	1	1
25 to 30	1	3	4
30 to 35	17	43	60
35 to 40	29	104	133
40 to 45	51	151	202
45 to 50	89	201	290
50 to 55	86	167	253
55 to 60	71	113	184
60 to 65	24	27	51
65 and up	4	8	12
Total	372	818	1,190

Child Beneficiaries as of July 1, 1998 *
Number of Persons

Age	Number
<5	0
5 to 6	3
7 to 8	2
9 to 10	3
11 to 12	2
13 to 14	12
15 to 16	6
17 and up	11
Total	39

* Child Beneficiaries all receive $200 per month, for a total of $93,600 per year.

Teachers' Retirement System
State of Montana

Appendix D

Comparative Schedules

This section contains tables that summarize the experience of the System shown in present and past valuation reports.

Table D-1 shows a summary of the active members and the annuitants covered as of the various valuation dates.

Table D-2 summarizes the contribution rates determined by each annual actuarial valuation.

Teachers' Retirement System State of Montana

Table D-1

Membership Data

Valuation Date (July 1)	Active Members: Full-Time Members	Part-Time Members	Total Contributing Members	Annual Full-Time Salaries in Thousands	Average Full-Time Annual Salary	Average Age	Average Years of Service
1987	13,105	1,955	15,060	$340,481	$25,981	*	*
1989	12,546	2,541	15,087	339,866	27,090	*	*
1992	13,502	3,141	16,643	401,092	29,706	42.4	11.6
1994	14,938	2,637	17,575	416,968	27,914	42.5	11.0
1996	13,251	5,444	18,695	424,085	32,004	43.3	11.6
1998	13,545	4,647	18,192	459,191	33,901	44.0	12.1

**Not available.*

Valuation Date (July 1)	Annuitants: Number	Annual Benefits in Thousands	Average Annual Benefit
1987	6,036	$43,236	$7,163
1989	6,330	49,546	7,827
1992	6,927	63,483	9,165
1994	7,530	78,183	10,383
1996	7,896	87,351	11,063
1998	8,362	99,040	11,844

Teachers' Retirement System State of Montana

Table D-2

Contribution Rates

Valuation Date (July 1)	Normal Cost Rate		UAL Rate	Total Employer Rate	Total Rate
	Employee	Employer			
1989*	7.044%	1.783%	5.676%	7.459%	14.503%
1992	7.044%	2.832%	4.627%	7.459%	14.503%
1994	7.044%	2.450%	5.020%	7.470%	14.514%
1996	7.044%	2.284%	5.186%	7.470%	14.514%
1998	7.044%	1.836%	5.634%	7.470%	14.514%

**Valuation performed by Hendrickson, Miller & Associates, Inc.*

Teachers' Retirement System
State of Montana

Appendix E

Glossary

The following definitions are largely excerpts from a list adopted in 1981 by the major actuarial organizations in the United States. In some cases the definitions have been modified for specific applicability to the Teachers' Retirement System Retirement System. Defined terms are capitalized throughout this Appendix.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement, and retirement; changes in compensation, rates of investment earnings, and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Liability.

Actuarial Gain (Loss)

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

Actuarial Present Value

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Valuation

The determination, as of a valuation date, of the Normal Cost, Actuarial Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

Amortization Payment

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Liability.

Entry Age Actuarial Cost Method

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Liability.

Normal Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Actuarial Liability

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Unfunded Actuarial Liability

The excess of the Actuarial Liability over the Actuarial Value of Assets.

Accrued Benefit

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

Projected Benefits

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.

Unaccrued Benefit

The excess of an individual's Projected Benefits over the Accrued Benefits as of a specified date.

STATISTICAL SECTION

REVENUES BY SOURCE & EXPENSES BY TYPE

CONTRIBUTION RATES

ACTIVE MEMBERS

RETIRED MEMBERS

LOCATION OF BENEFIT RECIPIENTS

Revenues By Source

Year	Employee Contributions	Employer Contributions	Investment Income	Other	Total
1989 - 1990	$30,549,466	$30,646,428	$63,748,295		$124,944,189
1990 - 1991	32,611,152	33,274,827	67,033,563		132,919,542
1991 - 1992	34,677,311	35,759,120	70,680,973		141,117,404
1992 - 1993	37,249,490	38,088,280	78,375,511		153,713,281
1993 - 1994	38,748,884	39,164,487	73,076,482		150,989,853
1994 - 1995	37,782,158	39,071,610	72,498,507	127,416	149,479,691
1995 - 1996	39,174,350	40,626,732	98,083,315	189,823	178,074,220
1996 - 1997	40,348,306	41,639,722	104,797,668	101,267	186,886,963
1997 - 1998	41,937,700	44,476,127	102,174,892	200,083	188,788,802
1998 - 1999	42,641,714	44,986,852	102,501,716	102,540	190,232,822

Expenses By Type

Year	Benefit Payments	Withdrawals	Admin. Expenses	Investment Expenses	Other	Total
1989 - 1990	$51,033,464	$8,561,498	$520,926	$166,134		$60,282,022
1990 - 1991	54,869,861	4,243,421	485,918	191,692		59,790,892
1991 - 1992	60,763,611	3,307,312	684,415	180,920		64,936,258
1992 - 1993	66,012,320	3,971,610	581,165	188,655		70,753,750
1993 - 1994	70,580,682	4,156,137	647,480	198,704		75,583,003
1994 - 1995	78,589,558	3,373,147	628,596	177,081		82,768,382
1995 - 1996	83,763,230	4,158,612	684,885	12,711,571		101,318,298
1996 - 1997	88,631,324	3,839,562	675,961	12,596,802		105,743,649
1997 - 1998	94,204,970	4,826,198	881,452	10,381,523		110,294,143
1998 - 1999	100,028,083	5,126,013	1,360,660	9,686,951		116,201,707

Teachers' Retirement System

Contribution Rates

EMPLOYEE

1937 - 1973	5.000%
1973 - 1975	5.125%
1975 - 1977	6.125%
1977 - 1983	6.187%
1983 - 1999	7.044%
1999 -	7.150%

EMPLOYER

1937 - 1945	NONE
1945 - 1959	3.750%
1959 - 1969	4.000%
1969 - 1971	4.500%
1971 - 1975	5.125%
1975 - 1977	6.250%
1977 - 1981	6.312%
1981 - 09/30/81	6.432%
10/01/81 - 06/30/83	6.463%
1983 - 1985	7.320%
1985 - 1989	7.428%
1989 - 1993	7.459%
01/01/94 -	7.470%

Unless otherwise noted, contribution rate changes occur on July 1.

Teachers' Retirement System

Membership

Period Ended	Active Members	Inactive Vested Members	Inactive Non-vested	Total
June 30, 1990	15,702	1,137	4,080	20,919
June 30, 1991	16,281	1,102	4,469	21,852
June 30, 1992	16,643	1,167	4,890	22,700
June 30, 1993	17,211	1,171	5,375	23,757
June 30, 1994	17,439	1,113	5,761	24,313
June 30, 1995	18,062	1,130	6,201	25,393
June 30, 1996	18,332	1,012	6,050	25,394
June 30, 1997	18,222	1,173	7,560	26,955
June 30, 1998	18,205	1,179	8,061	27,445
June 30, 1999	18,287	1,209	8,612	28,108

Retired Members and Benefit Recipients

Period Ended	Retirement	Survivors	Disability	Child Benefits	Total
June 30, 1990	5,903	334	265	56	6,558
June 30, 1991	5,882	339	261	46	6,528
June 30, 1992	6,042	343	263	47	6,695
June 30, 1993	6,227	355	267	50	6,899
June 30, 1994	6,531	358	271	38	7,198
June 30, 1995	6,800	365	274	35	7,474
June 30, 1996	7,011	370	273	34	7,688
June 30, 1997	7,212	366	279	44	7,901
June 30, 1998	7,400	376	276	36	8,088
June 30, 1999	7,661	377	282	38	8,358

Location of Benefit Recipients

Alabama	7	New Mexico	19
Alaska	29	New York	12
Arizona	177	North Carolina	16
Arkansas	12	North Dakota	76
California	127	Ohio	12
Colorado	81	Oklahoma	15
Connecticut	6	Oregon	146
Florida	40	Pennsylvania	9
Georgia	8	South Carolina	6
Hawaii	5	South Dakota	34
Idaho	108	Tennessee	9
Illinois	10	Texas	40
Indiana	4	Utah	38
Iowa	9	Vermont	2
Kansas	11	Virginia	13
Kentucky	2	Washington	285
Louisiana	2	West Virginia	3
Maine	5	Wisconsin	29
Maryland	3	Wyoming	65
Massachusetts	6	APO	3
Michigan	11	Australia	2
Minnesota	54	Canada	12
Mississippi	3	Holland	1
Missouri	20	New Zealand	2
Montana	6,537	Puerto Rico	1
Nebraska	18	Scotland	1
Nevada	82	Japan	1
		TOTAL	*8,231
New Jersey	2	*127 recipients receive two benefits.	

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